

**Final**

**Site Investigation Report**  
**Buildings South of Reilly Airfield, Parcel 501(7)**

**Fort McClellan**  
**Calhoun County, Alabama**

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## ***List of Acronyms***

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See Attachment 1.

## ***Executive Summary***

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In accordance with Contract Number DACA21-96-D-0018, Task Order CK08, IT Corporation completed a site investigation (SI) at the Buildings South of Reilly Airfield, Parcel 501(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations would present an unacceptable risk to human health or the environment. The SI at the Buildings South of Reilly Airfield, Parcel 501(7), consisted of the sampling and analyses of ten surface soil samples, three depositional soil samples, ten subsurface soil samples, and six groundwater samples. In addition, six permanent groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the Buildings South of Reilly Airfield, Parcel 501(7), indicate that metals, volatile organic compounds, and semivolatile organic compounds (SVOC) were detected in the various site media. To evaluate whether detected constituents pose an unacceptable risk to human health or the environment, analytical results were compared to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for Fort McClellan.

The potential threat to human receptors is expected to be low. Although the site is projected for industrial use, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use. In soils, the concentrations of eight metals (aluminum, arsenic, chromium, iron, lead, manganese, thallium, and vanadium) exceeded SSSLs. However, with the exception of lead at one sample location, the concentrations of the metals that exceeded SSSLs were below the respective background concentration or within the range of background values. The lead concentration (480 milligrams per kilogram [mg/kg]) marginally exceeded the residential human health SSSL (400 mg/kg). Two SVOCs (polynuclear aromatic hydrocarbon [PAH] compounds) were detected in two depositional soil samples at concentrations exceeding SSSLs but below PAH background values.

Four metals (beryllium, cadmium, lead, and zinc) were detected in surface and depositional soils (primarily in one depositional soil sample) at concentrations exceeding ESVs and the range of background values. The concentrations of four SVOCs (PAH compounds) exceeded ESVs in

two depositional soil samples but were below PAH background values. In addition, one volatile organic compound (trichloroethene) was detected in seven surface soil samples at concentrations exceeding the ESV. The cumulative trichloroethene concentration in the surface and depositional soil samples collected was 0.0192 mg/kg. However, the potential impact to ecological receptors is expected to be minimal based on site conditions. Nearly the entire site is covered with asphalt/concrete pavement and a few small buildings with limited grassy areas. The site does not currently support viable ecological habitat and is not expected to support ecological habitat in the projected (industrial) land use scenario.

Based on the results of the SI, past operations at the Buildings South of Reilly Airfield, Parcel 501(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT Corporation recommends “No Further Action” and unrestricted reuse with regard to hazardous, toxic, and radioactive waste at the Buildings South of Reilly Airfield, Parcel 501(7).

## **1.0 Introduction**

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The U.S. Army has selected Fort McClellan (FTMC) located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels at FTMC under the management of the U.S. Army Corps of Engineers (USACE), Mobile District. The USACE contracted with IT Corporation (IT) to perform the site investigation (SI) at the Buildings South of Reilly Airfield, Parcel 501(7), under Contract Number DACA21-96-D-0018, Task Order CK08.

This SI report presents specific information and results compiled from the SI, including field sampling and analysis and monitoring well installation activities, conducted at the Buildings South of Reilly Airfield, Parcel 501(7).

### **1.1 Project Description**

The Buildings South of Reilly Airfield were identified as an area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

A site-specific field sampling plan (SFSP) attachment (IT, 1999) and a site-specific safety and health plan (SSHP) attachment were finalized in October 1999. The SFSP and SSHP were prepared to provide technical guidance for sample collection and analysis at the Buildings South of Reilly Airfield, Parcel 501(7). The SFSP was used in conjunction with the SSHP as attachments to the installation-wide work plan (IT, 1998) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The SAP includes the installation-wide safety and health plan and quality assurance plan.

The SI included fieldwork to collect ten surface soil samples, ten subsurface soil samples, six groundwater samples, and three depositional soil samples to determine whether potential site-

specific chemicals are present at the site and to provide data useful for supporting any future corrective measures and closure activities.

## **1.2 Purpose and Objectives**

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at the Buildings South of Reilly Airfield, Parcel 501(7), at concentrations that would present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs, ESVs, and polynuclear aromatic hydrocarbon (PAH) background screening values are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). The PAH background screening values were developed by IT at the direction of the BRAC Cleanup Team to address the occurrence of PAH compounds in surface soils as a result of anthropogenic activities at FTMC. Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide to propose “No Further Action” at the site or to conduct additional work at the site.

## **1.3 Site Description and History**

The Buildings South of Reilly Airfield (Parcel 501[7]) are located in the northern area of the Main Post at the north end of 10th Street and south of Reilly Airfield (Figures 1-1 and 1-2). Reilly Airfield was a small asphalt airstrip with a paved area and four buildings. At one time, a prefabricated hangar was located on the east side of the paved area, but it was removed. A review of aerial photographs from 1964 through 1982 showed a building located south of Building T-421, where a concrete pad is located. From the aerial photographs, it appeared that the building was removed sometime between 1982 and 1994. Based on the description of the hangar, this was the likely location of the hangar (Figure 1-2).

The area encompassed by Parcel 501(7) covers approximately 1.75 acres and was previously controlled by the Special Operations of U.S. Army Military Police as part of the Protective Services' Evasive Driving Course. The area was used as part of the Protective Services' Evasive Driving Course for about 15 to 16 years (Weems, 1999). Prior to that, this area was used by the FTMC Recreation Services to store and rent recreational equipment such as boats, campers, and camping gear to FTMC personnel. This compound contains three buildings: Building T-421, formerly used as an office building for the evasive driving course; Building 425, formerly used for light vehicle maintenance; and Building 416, a flammable storage shed formerly used to store vehicle oils and fluids (Weems, 1999). A paved area located immediately north of Parcel 501(7) was previously controlled by the FTMC Directorate of Community Safety and was used as an impoundment yard for abandoned vehicles.

The elevation of the site is approximately 735 feet above mean sea level. Surface runoff follows site topography and generally flows to the west. Groundwater flow at the site is to the northeast.

## **2.0 Previous Investigations**

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An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal (including migration) has occurred
2. Areas where only release or disposal of petroleum products has occurred
3. Areas of contamination below action levels
4. Areas where all necessary remedial actions have been taken
5. Areas of known contamination with removal and/or remedial action underway
6. Areas of known contamination where required response actions have not been taken
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management, the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Buildings South of Reilly Airfield were identified as a Category 7 CERFA site: areas that are not evaluated or require further evaluation. There have not been any investigations recorded at this area. The site lacked adequate documentation and, therefore, required additional evaluation to determine the environmental condition of the parcel.

## **3.0 Current Site Investigation Activities**

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This chapter summarizes SI activities conducted by IT at the Buildings South of Reilly Airfield, Parcel 501(7), including environmental sampling and analysis, and groundwater monitoring well installation activities.

### **3.1 Environmental Sampling**

The environmental sampling performed during the SI at the Buildings South of Reilly Airfield, Parcel 501(7), included the collection of surface and depositional soil samples, subsurface soil samples, and groundwater samples for chemical analysis. The sample locations were determined by observing site physical characteristics noted during a site walkover and by reviewing historical documents pertaining to activities conducted at the site. The sample locations, media, and rationale are summarized in Table 3-1. Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.3.

#### **3.1.1 Surface and Depositional Soil Sampling**

Surface soil samples were collected from ten locations and depositional soil samples were collected from three locations at the Buildings South of Reilly Airfield, Parcel 501(7), as shown on Figure 3-1. Soil sampling locations and rationale are presented in Table 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried utilities.

**Sample Collection.** Surface soil samples were collected from the upper 1 foot of soil by either direct-push technology or with a 3-inch diameter stainless-steel hand auger using the methodology specified in Section 4.9 of the SAP (IT, 2000a). Depositional soil samples were collected from the upper 1 foot of soil with a stainless-steel trowel. Surface and depositional soil samples were collected by first removing surface debris, such as rocks and vegetation, from the immediate sample area. The soil was then collected with the sampling device and screened with a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a). Samples for volatile organic compound (VOC) analyses were collected directly from the sampler with three EnCore<sup>®</sup> samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3. Sample collection logs are included in Appendix A.

Table 3-1

**Sampling Locations and Rationale**  
**Buildings South of Reilly Airfield, Parcel 501(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Media	Sample Location Rationale
GSBP-501-MW01	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the southwest corner of the former Directorate of Community Safety impoundment yard to determine environmental conditions downgradient of Parcel 501(7).
GSBP-501-MW02	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the northeast corner of the parking area of the former evasive driving course compound to determine if contaminant releases into the environment have occurred from use of this compound in this area and if contaminated soil exists at this site.
GSBP-501-MW03(SS) GSBP-501-MW03(W)	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected in front (west) of Building 425 to determine if contaminant releases into the environment have occurred from use of this building and the compound in this area and if contaminated soil exists at this site.
GSBP-501-MW04	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected west of Building 416 to determine if contaminant releases into the environment have occurred from use of this building and the compound in this area and if contaminated soil exists at this site.
GSBP-501-MW05	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected at the northwest corner of the former Directorate of Community Safety impoundment yard to determine environmental conditions downgradient of Parcel 501(7).
GSBP-501-MW06	Surface Soil Subsurface Soil Groundwater	Surface soil, subsurface soil, and groundwater samples were collected north of the southwest corner of Parcel 501(7) to determine if contaminant releases into the environment have occurred from use of the compound in this area and if contaminated soil exists at this site.
GSBP-501-GP01	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected at the east side of the former Directorate of Community Safety impoundment yard to determine environmental conditions downgradient of Parcel 501(7).
GSBP-501-GP02	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected east of the former Directorate of Community Safety impoundment yard to determine environmental conditions downgradient of Parcel 501(7).
GSBP-501-GP03	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected at the northwest corner of Building 425 to determine if contaminant releases into the environment have occurred from use of the compound in this area and if contaminated soil exists at this site.
GSBP-501-GP04	Surface Soil Subsurface Soil	Surface and subsurface soil samples were collected at the southwest corner of the concrete pad west of Building 416 to determine if contaminant releases into the environment have occurred from use of the compound in this area and if contaminated soil exists at this site.
GSBP-501-DEP01	Depositional Soil	A depositional soil sample was collected in the drainage ditch east of Building T-421 to determine if contaminant releases have occurred from runoff from the parcel.
GSBP-501-DEP02	Depositional Soil	A depositional soil sample was collected in the drainage ditch at the southeast corner of the parcel to determine if contaminant releases have occurred from runoff from the facilities in the former evasive driving course compound.
GSBP-501-DEP03	Depositional Soil	A depositional soil sample was collected in the intermittent stream bed located west of the parcel to determine if contaminant releases have occurred from runoff from the parcel. This location was planned as a surface water/sediment sample however the stream bed was dry at the time of sample collection.

Table 3-2

**Surface Soil, Subsurface Soil, and Depositional Soil Sample Designations and QA/QC Samples  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft. bgs)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
GSBP-501-MW01	GSBP-501-MW01-SS-BX0001-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW01-DS-BX0002-REG	10-12				
GSBP-501-MW02	GSBP-501-MW02-SS-BX0003-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW02-DS-BX0004-REG	10-12	GSBP-501-MW02-DS-BX0005-FD	GSBP-501-MW02-DS-BX0006-FS		
GSBP-501-MW03(SS)	GSBP-501-MW03-SS-BX0007-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW03-DS-BX0008-REG	10-12				
GSBP-501-MW04	GSBP-501-MW04-SS-BX0009-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW04-DS-BX0010-REG	10-12				
GSBP-501-MW05	GSBP-501-MW05-SS-BX0011-REG	0-1			GSBP-501-MW05-DS-BX0012-MS GSBP-501-MW05-DS-BX0012-MSD	TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW05-DS-BX0012-REG	10-12				
GSBP-501-MW06	GSBP-501-MW06-SS-BX0013-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-MW06-DS-BX0014-REG	10-12				
GSBP-501-GP01	GSBP-501-GP01-SS-BX0015-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-GP01-DS-BX0016-REG	10-12				
GSBP-501-GP02	GSBP-501-GP02-SS-BX0017-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-GP02-DS-BX0018-REG	10-12				
GSBP-501-GP03	GSBP-501-GP03-SS-BX0019-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-GP03-DS-BX0020-REG	10-12				
GSBP-501-GP04	GSBP-501-GP04-SS-BX0021-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
	GSBP-501-GP04-DS-BX0022-REG	10-11				
GSBP-501-DEP01	GSBP-501-DEP01-DEP-BX0023-REG	0-1				TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-DEP02	GSBP-501-DEP02-DEP-BX0024-REG	0-1	GSBP-501-DEP02-DEP-BX0025-FD			TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-DEP03	GSBP-501-DEP03-DEP-BX0026-REG	0-0.5				TCL VOCs, TCL SVOCs, TAL Metals

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

### **3.1.2 Subsurface Soil Sampling**

Subsurface soil samples were collected from ten soil borings at the Buildings South of Reilly Airfield, Parcel 501(7). Subsurface soil sampling locations and rationale are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, site topography, and buried and overhead utilities. IT contracted TEG, Inc., a direct-push technology subcontractor, to assist in subsurface soil sample collection.

**Sample Collection.** Subsurface soil samples were collected from soil borings at depths greater than 1 foot below ground surface (bgs) in the unsaturated zone. The soil borings were advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.9.1.1 of the SAP (IT, 2000a). Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3.

Subsurface soil samples were collected continuously to 12 feet bgs or until direct-push sampler refusal was encountered. Samples were field screened using a PID in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample displaying the highest reading was selected and sent to the laboratory for analysis; however, at those locations where PID readings were not greater than background, the deepest sample interval above the saturated zone was submitted for analyses. Samples to be analyzed for VOCs were collected directly from the sampler with three EnCore<sup>®</sup> samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. Samples submitted for laboratory analyses are summarized in Table 3-2. The on-site geologist constructed a detailed boring log for each soil boring. The lithological log for each borehole is included in Appendix B.

At the completion of soil sampling, boreholes were abandoned with hydrated bentonite chips following borehole abandonment procedures summarized in Appendix B of the SAP (IT, 2000a).

### **3.1.3 Well Installation**

Six permanent wells were installed in the residuum groundwater zone at the Buildings South of Reilly Airfield, Parcel 501(7), to collect groundwater samples for laboratory analyses. The well/groundwater sample locations are shown on Figure 3-1. Table 3-3 summarizes construction details of the wells installed at the site. The well construction logs are included in Appendix B.

IT contracted Miller Drilling, Inc., to install the permanent wells with a hollow-stem auger rig in November 1999 at the well/groundwater sample locations shown on Figure 3-1. IT attempted to install the wells at the locations where direct-push soil samples were collected. However, at locations where this was not possible because of rig access or overhead and underground utilities, the temporary well location was offset from the soil boring location. The soil sampling location was identified with “(SS)” and the associated well location was identified with “(W)”. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes at these locations were advanced with a 4.25-inch inside diameter (ID) hollow-stem auger from ground surface to the first water-bearing zone in residuum at the well location. The borehole was augered to the depth of direct-push sampler refusal and samples were collected at the depth of direct-push refusal to the bottom of the borehole. A 2-foot long, 2-inch ID carbon steel split spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist logging the auger boreholes continued the lithological log for each borehole from the depth of split-spoon sampler refusal to the bottom of the auger borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geologic and hydrogeologic information. The lithological log for each borehole is included in Appendix B.

Upon reaching the target depth, a 2-inch ID, 0.010-inch slot size, continuously wrapped, Schedule 40 polyvinyl chloride (PVC) screen with a 1-foot PVC sump or 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The 3-inch end cap was used at locations where bedrock (auger refusal) was encountered. The 1-foot sump was used at locations where auger refusal was not encountered to prevent the buildup of sediment at the bottom of the well screen. The screen and sump/end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A number 1 filter sand was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The wells were surged approximately 10 minutes, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite pellets, was placed immediately on top of the filter sand and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite chips were allowed to hydrate in the groundwater. The bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). The wells were then grouted to ground surface and a 3-foot by 3-foot by 4-inch concrete pad was installed flush to ground surface. A locking well cap was placed on top of

**Table 3-3**

**Well Construction Summary  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Well</b>	<b>Northing</b>	<b>Easting</b>	<b>Ground Elevation (ft msl)</b>	<b>TOC Elevation (ft msl)</b>	<b>Well Depth (ft bgs)</b>	<b>Screen Length (ft)</b>	<b>Screen Interval (ft bgs)</b>	<b>Sump Interval (ft bgs)</b>	<b>Well Material</b>
GSBP-501-MW01	1179961.85	672143.13	740.80	740.48	30.0	15	14 - 29	29 - 30	2" ID Sch. 40 PVC
GSBP-501-MW02	1179920.74	672273.72	741.75	741.43	20.0	15	5 - 20	20.0 - 20.25	2" ID Sch. 40 PVC
GSBP-501-MW03(W)	1179803.59	672368.43	739.59	739.38	28.5	15	12.5 - 27.5	27.5 - 28.5	2" ID Sch. 40 PVC
GSBP-501-MW04	1179773.15	672308.47	741.39	741.41	29.0	15	13 - 28	28 - 29	2" ID Sch. 40 PVC
GSBP-501-MW05	1180091.32	672146.17	742.16	741.83	26.5	15	10.5 - 25.5	25.5 - 26.5	2" ID Sch. 40 PVC
GSBP-501-MW06	1179732.41	672139.27	739.59	739.38	26.0	15	10 - 25	25 - 26	2" ID Sch. 40 PVC

Wells installed with an auger drill rig using a 4.25-inch inside diameter hollow-stem auger.

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum (NAD83), 1983.

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

2" ID Sch. 40 PVC - 2-inch inside diameter, Schedule 40, polyvinyl chloride.

bgs - Below ground surface.

ft - Feet.

msl - Mean sea level.

TOC - Top of casing.

the PVC well casing with a steel, 8-inch-diameter, traffic-bearing vault placed around the well casing, flush to the concrete surface pad.

The wells were developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). Development continued until the water turbidity was equal to or less than 20 nephelometric turbidity units or for a maximum of 8 hours. The well development logs are included in Appendix C.

#### **3.1.4 Water Level Measurements**

The depth to groundwater was measured in wells at the Buildings South of Reilly Airfield, Parcel 501(7), in March 2000 following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with an electronic water level meter. The meter probe and cable were cleaned between use at each well following decontamination methodology presented in Section 4.10 of the SAP (IT, 2000a). Measurements were referenced to the top of the PVC stickup. A summary of groundwater level measurements is presented in Table 3-4.

#### **3.1.5 Groundwater Sampling**

Groundwater was sampled from the six permanent wells installed at the Buildings South of Reilly Airfield, Parcel 501(7). The well/groundwater sampling locations are shown on Figure 3-1. The groundwater sampling locations and rationale are listed in Table 3-1. The groundwater sample designations and QA/QC samples are listed in Table 3-5. Monitoring well GSBP-501-MW02 was resampled (sample number BX3004R) on July 7, 2000 as part of a groundwater resampling study to evaluate the effect of elevated turbidity on metals concentrations (IT, 2000c).

**Sample Collection.** Groundwater sampling was performed following procedures outlined in Section 4.9 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum 3 well volumes and field parameters, including temperature, pH, specific conductivity, oxidation-reduction potential, and turbidity, stabilized. Purging and sampling were performed with a submersible pump equipped with Teflon<sup>™</sup> tubing. Field parameters were measured using a Horiba<sup>®</sup> U-10 water quality unit. Field parameter readings are summarized in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

### **3.2 Surveying of Sample Locations**

Sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a), and conventional civil survey techniques described in

**Table 3-4**

**Groundwater Elevations  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Well Location</b>	<b>Date</b>	<b>Depth to Water (ft BTOC)</b>	<b>Ground Elevation (ft msl)</b>	<b>Top of Casing Elevation (ft msl)</b>	<b>Groundwater Elevation (ft msl)</b>
GSBP-501-MW01	13-Mar-00	6.98	740.80	740.48	733.50
GSBP-501-MW02	13-Mar-00	9.45	741.75	741.43	731.98
GSBP-501-MW03(W)	13-Mar-00	9.12	739.59	739.38	730.26
GSBP-501-MW04	13-Mar-00	8.67	741.39	741.41	732.74
GSBP-501-MW05	13-Mar-00	11.31	742.16	741.83	730.52
GSBP-501-MW06	13-Mar-00	2.45	739.59	739.38	736.93

Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

BTOC - Below top of casing.

ft - Feet.

msl - Mean sea level.

Table 3-5

**Groundwater Sample Designations and QA/QC Samples  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
GSBP-501-MW01	GSBP-501-MW01-GW-BX3001-REG	10.55-29.00	GSBP-501-MW01-GW-BX3002-FD	GSBP-501-MW01-GW-BX3003-FS		TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-MW02	GSBP-501-MW02-GW-BX3004-REG	14.21-20.00			GSBP-501-MW02-GW-BX3004-MS GSBP-501-MW02-GW-BX3004-MSD	TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-MW02*	GSBP-501-MW02-GW-BX3004R-REG*	12.86-20.00				TAL Metals
GSBP-501-MW03(W)	GSBP-501-MW03-GW-BX3005-REG	14.17-27.50				TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-MW04	GSBP-501-MW04-GW-BX3006-REG	15.81-28.00				TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-MW05	GSBP-501-MW05-GW-BX3007-REG	14.01-25.50				TCL VOCs, TCL SVOCs, TAL Metals
GSBP-501-MW06	GSBP-501-MW06-GW-BX3008-REG	11.40-25.00				TCL VOCs, TCL SVOCs, TAL Metals

\* Well resampled on July 7, 2000.

FD - Field duplicate.

FS - Field split.

ft - Feet.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

VOC - Volatile organic compound.

**Table 3-6**

**Groundwater Field Parameters  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Sample Location</b>	<b>Date</b>	<b>Media</b>	<b>Specific Conductivity (mS/cm)</b>	<b>Dissolved Oxygen (ppm)</b>	<b>Redox Potential (mV)</b>	<b>Temperature (°C)</b>	<b>Turbidity (NTUs)</b>	<b>pH (Std units)</b>
GSBP-501-MW01	5-Jan-00	GW	0.253	3.98	NR	18.2	237.0	6.37
GSBP-501-MW02	5-Jan-00	GW	0.389	0.62	NR	20.5	>1000	6.60
GSBP-501-MW02*	7-Jul-00	GW	0.315	NR	110	24.7	8.5	6.16
GSBP-501-MW03(W)	5-Jan-00	GW	0.077	2.56	NR	16.1	15.6	5.83
GSBP-501-MW04	5-Jan-00	GW	0.109	1.39	NR	16.3	16.8	5.80
GSBP-501-MW05	4-Jan-00	GW	0.400	1.38	NR	19.8	17.1	6.58
GSBP-501-MW06	4-Jan-00	GW	0.231	0.72	NR	17.2	25.4	5.77

\* Well resampled on July 7, 2000.

°C - Degrees Celsius.

GW - Groundwater.

mS/cm - MilliSiemens per centimeter.

mV - Millivolts.

NR - Reading not recorded due to equipment malfunction.

NTUs - Nephelometric turbidity units.

ppm - Parts per million.

Std units - Standard units.

SW - Surface water.

Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

### **3.3 Analytical Program**

Samples collected during the SI were analyzed for various chemical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, Alabama Department of Environmental Management, FTMC, and USACE requirements. Target analyses for samples collected at the Buildings South of Reilly Airfield, Parcel 501(7), included the following parameters:

- Target compound list VOCs - Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) - Method 8270C
- Target analyte list metals - Method 6010B/7000.

The samples were analyzed using EPA SW-846 methods, including Update III methods where applicable, as presented in Table 6-1 in Appendix B of the SAP (IT, 2000a). Data were reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard copy data packages by the laboratory using Contract Laboratory Program-like forms. These packages were validated in accordance with EPA National Functional Guidelines by Level III criteria. A summary of validated data is included in Appendix E. The Data Validation Summary Report is included as Appendix F.

### **3.4 Sample Preservation, Packaging, and Shipping**

Sample preservation, packaging, and shipping followed requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custodies were recorded as specified in Section 4.13 of the SAP (IT, 2000a).

Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in

Knoxville, Tennessee. Split samples were shipped to USACE South Atlantic Division Laboratory in Marietta, Georgia.

### **3.5 Investigation-Derived Waste Management and Disposal**

Investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at the Buildings South of Reilly Airfield, Parcel 501(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities, and decontamination fluids
- Spent well materials and personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined rolloff bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure analyses. Based on the results, drill cuttings, spent well materials, and personal protective equipment generated during the SI were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

### **3.6 Variances/Nonconformances**

This section describes variances and nonconformances to the SFSP that occurred during completion of the SI at the Buildings South of Reilly Airfield, Parcel 501(7).

#### **3.6.1 Variances**

Two variances to the SFSP were recorded during completion of the SI. The variances did not alter the intent of the investigation or the sampling rationale presented in Table 4-2 of the SFSP (IT, 1999). The variances to the SFSP are summarized in Table 3-7 and included in Appendix G.

#### **3.6.2 Nonconformances**

There were not any nonconformances to the SFSP recorded during completion of the SI.

### **3.7 Data Quality**

The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan; the FTMC SAP and quality assurance plan; and standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A. As discussed in Section 3.6, there were two variances to the SFSP. However, the variances did not impact the usability of the data.

**Data Validation.** A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F consists of a data validation summary report that was prepared to discuss the results of the validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC IT Environmental Management System<sup>TM</sup> database for tracking and reporting. The qualified data were used in the comparison to the SSSLs and ESVs. Rejected data (assigned an “R” qualifier) were not used in the comparison to the SSSLs and ESVs.

The data presented in this report, except where qualified, meet the principle data quality objective for this SI.

**Table 3-7**

**Variances to the Site-Specific Field Sampling Plan  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

<b>Variance to the SFSP</b>	<b>Justification for Variance</b>	<b>Impact to Site Investigation</b>
Groundwater monitoring well GSBP-501-MW03 was offset approximately 10 feet north of the direct-push soil boring location.	Well location GSBP-501-MW03 was offset approximately 10 feet north of the direct-push soil boring location because of overhead utility lines.	None. Moving the well location allowed installation of the well and subsequent collection of groundwater sample.
Surface water/sediment sample GSBP-501-SW/SD01 proposed in the site-specific field sampling plan was not collected.	Surface water/sediment sample GSBP-501-SW/SD01 was not collected because water was not present in the intermittent stream west of the parcel at the time of sample collection.	None. A depositional soil sample (GSBP-501-DEP03) was collected at the proposed surface water/sediment location in the intermittent stream west of the parcel.

## **4.0 Site Characterization**

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Subsurface investigations performed at the Buildings South of Reilly Airfield, Parcel 501(7), provided soil, bedrock, and groundwater data. These data were used to characterize the geology and hydrogeology of the site.

### **4.1 Regional and Site Geology**

#### **4.1.1 Regional Geology**

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold and thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold and thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults, and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group is comprised of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984), but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated

greenish-gray and black mudstone makes up the Nichols Formation with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appear to dominate the unit and consist primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consist of sandy and micaceous shale and silty, micaceous mudstone, which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east, and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962), (Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in

Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weathers to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded "window" in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites, and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian Age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned

the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence comprising the Eden thrust sheet is exposed at FTMC through an eroded "window" or "fenster" in the overlying thrust sheet. Rocks within the window display complex folding with the folds being overturned, and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

#### **4.1.2 Site Geology**

Soils at the Buildings South of Reilly Airfield, Parcel 501(7) consist of Cumberland gravelly loam (northern section of Parcel 501[7]), Philo and Stendal soils (middle section of Parcel 501[7]), and Anniston gravelly clay loam (southern section of Parcel 501[7]) (U.S. Department of Agriculture, 1961). The Cumberland Series of soils consists of deep, well-drained soils on stream terraces. These soils have developed in old general alluvium that washed from soils derived mainly from limestone and cherty limestone, and to some extent, shale and sandstone. The Philo and Stendal soils consist of local alluvium that is along foot slopes and along and at the heads of small drainageways or draws. These soils have developed from local alluvium that washed chiefly from sandstone and shale. The Anniston gravelly loam consists of areas that formerly were Anniston gravelly loam or Allen gravelly loam that have lost nearly all of their original surface soil through erosion (U.S. Department of Agriculture, 1961).

Bedrock beneath the Buildings South of Reilly Airfield is mapped as the Cambrian Conasauga formation (Osborne et al., 1997). This unit is the northern border to the eroded "window" in the uppermost structural thrust sheet at FTMC.

A geologic cross section was constructed from direct-push and hollow-stem auger boring data collected during the SI, as shown on Figure 4-1. The geologic cross-section location is shown on Figure 3-1. Based on the cross section, residuum beneath the Buildings South of Reilly Airfield consists of predominantly clayey sand and silty sand. Limestone (auger refusal) was encountered

during the well installation of GSBP-501-MW02. Weathered shale was encountered at about 24 feet bgs during the well installation of GSBP-501-MW05. This suggests a limestone/shale contact between GSBP-501-MW02 and GSBP-501-MW05, as shown on Figure 4-1.

## **4.2 Site Hydrology**

### **4.2.1 Surface Hydrology**

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates. The major surface water features on the Main Post of FTMC include Remount Creek, Cane Creek, South Branch of Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Surface runoff at the Buildings South of Reilly Airfield follows site topography and generally flows west.

### **4.2.2 Hydrogeology**

Static groundwater levels were measured in monitoring wells at the Buildings South of Reilly Airfield on March 13, 2000. Table 3-4 summarizes the measured groundwater elevations. Figure 4-2 is a groundwater elevation contour map constructed from the March 2000 data.

Groundwater flow is to the northeast, as shown on Figure 4-2. The average hydraulic gradient is 0.03 feet per foot. During boring and well installation activities, groundwater was encountered within the residuum at depths ranging from 16 to 20.5 feet bgs. Static groundwater levels measured on March 13, 2000 are 4 to 13 feet above the depth to water encountered during well installation activities. This indicates that the groundwater has an upward hydraulic gradient and is under semiconfined conditions.

## **5.0 Summary of Analytical Results**

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The results of the chemical analyses of samples collected at the Buildings South of Reilly Airfield, Parcel 501(7), indicate that metals, VOCs, and SVOCs have been detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, detected constituent concentrations were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix H. Additionally, SVOC concentrations in surface and depositional soils that exceeded the SSSLs and ESVs were compared to PAH background screening values, where available. The PAH background screening values were derived from PAH analytical data from 18 parcels at FTMC that were determined to represent anthropogenic activity (IT, 2000b). PAH background screening values were developed for 2 categories of surface soils: beneath asphalt and adjacent to asphalt. The PAH background screening values for soils adjacent to asphalt are the more conservative (i.e., lower) of the PAH background values and are the values used herein for comparison.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), including 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields an RL of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has an RL of 0.330 mg/kg, which is typical for a soil matrix sample. Because of the direct nature of the Method 8260B analysis and its resulting lower reporting limit, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however, when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered. The validation qualifiers and

concentrations reported (e.g., whether concentrations were less than or greater than 0.330 mg/kg) were used to determine which analytical method was likely to return the more accurate result.

The following sections and Tables 5-1 through 5-3 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

### **5.1 Surface and Depositional Soil Analytical Results**

Ten surface soil samples and three depositional soil samples were collected for chemical analyses at the Buildings South of Reilly Airfield, Parcel 501(7). Surface and depositional soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and background screening values (metals and PAHs), as presented in Table 5-1.

**Metals.** Twenty metals were detected in surface and depositional soil samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). Nineteen of the twenty detected metals were present in each of the samples collected at GSBP-501-DEP01 and GSBP-501-DEP02.

The concentrations of seven metals (aluminum, arsenic, chromium, iron, lead, manganese, and thallium) exceeded SSSLs. With the exception of aluminum (GSBP-501-DEP02) and lead (GSBP-501-DEP01) in one sample each, the concentrations of the metals exceeding SSSLs were below the respective background concentration. The aluminum concentration at GSBP-501-DEP02 was within the range of background values determined by SAIC (1998) (Appendix H). The lead concentration at GSBP-501-DEP01 (480 mg/kg) exceeded the range of background values.

Twelve metals were detected at concentrations exceeding ESVs. Of these metals, the concentrations of aluminum (GSBP-501-DEP02), beryllium (GSBP-501-DEP02 and GSBP-501-MW06), cadmium (GSBP-501-DEP02 and GSBP-501-GP02), lead (GSBP-501-DEP01 and GSBP-501-DEP02), mercury (GSBP-501-DEP01 and GSBP-501-DEP02), and zinc (GSBP-501-DEP01, GSBP-501-DEP02, and GSBP-501-GP03) also exceeded the respective background concentration. The aluminum, mercury, and two of the three zinc results were within the range of background values determined by SAIC (1998) (Appendix H).

**Volatile Organic Compounds.** Twenty-four VOCs were detected in surface and depositional soil samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). The

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-DEP01 BX0023 18-Jan-00 0- 1					GSBP-501 GSBP-501-DEP02 BX0024 18-Jan-00 0- 1					GSBP-501 GSBP-501-DEP03 BX0026 20-Jun-00 0- 0.5					GSBP-501 GSBP-501-GP01 BX0015 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	8.67E+03			YES	YES	1.76E+04		YES	YES	YES	3.38E+03				YES	7.63E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	9.00E+00			YES		4.80E+00			YES		1.30E+00			YES		4.50E+00	J		YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	4.67E+01					1.68E+02		YES		YES	3.09E+01					6.73E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	3.20E-01	J				2.40E+00	J	YES		YES	3.30E-01	J				6.60E-01	J			
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	3.60E-01	J	YES			2.80E+00		YES		YES	ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.48E+03					1.94E+04	J	YES			4.93E+02	J				2.10E+03	J	YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.55E+01				YES	2.37E+01			YES	YES	4.50E+00				YES	1.11E+01	J			YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	4.30E+00	J				5.10E+00	J				1.40E+00	J				9.30E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	5.60E+00					1.30E+01		YES			1.70E+00	J				3.20E+00	B			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.45E+04			YES	YES	1.25E+04			YES	YES	4.02E+03			YES	YES	1.09E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	4.80E+02		YES	YES	YES	1.38E+02		YES		YES	9.30E+00					1.98E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	6.50E+02					3.90E+03	J	YES			1.61E+02	J				9.64E+02	J			
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	3.56E+02				YES	1.24E+03			YES	YES	2.21E+02	J			YES	1.51E+03	J		YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	2.90E-01		YES		YES	1.00E-01	B	YES		YES	2.40E-02	J				5.70E-02				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	4.20E+00	J				1.11E+01		YES			1.70E+00	J				4.50E+00				
Potassium	mg/kg	8.00E+02	NA	NA	3.35E+02	J				8.19E+02	J	YES			9.84E+01	J				1.95E+02	J			
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					ND					ND				
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	8.70E-01	B		YES		1.50E+00	B		YES	YES	ND					8.50E-01	B		YES	
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	2.46E+01				YES	2.77E+01				YES	1.05E+01				YES	2.07E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.17E+02		YES		YES	2.72E+02		YES		YES	1.11E+01					9.70E+00	J			
<b>VOLATILE ORGANIC COMPOUNDS</b>																								
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	1.00E-01	ND					ND					ND					ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					1.80E-03	J				ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND					9.60E-04	J			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					5.80E-03	J				ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	ND					ND					1.90E-02	B				9.70E-03	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					ND					ND					ND				
Cumene	mg/kg	NA	7.77E+02	NA	ND					ND					9.00E-02					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	3.50E-03	B				5.60E-03	B				2.20E-03	B				6.10E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					ND					2.10E-03	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					9.60E-03	B				ND				
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	ND					ND					ND					1.60E-03	J			YES
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	2.40E-03	J				4.20E-03	J				3.80E-03	B				ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND					1.40E-03	J			
n-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
o-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
p-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					2.30E-02					ND				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					1.80E-03	J				ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 8)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-DEP01 BX0023 18-Jan-00 0- 1					GSBP-501 GSBP-501-DEP02 BX0024 18-Jan-00 0- 1					GSBP-501 GSBP-501-DEP03 BX0026 20-Jun-00 0- 0.5					GSBP-501 GSBP-501-GP01 BX0015 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																								
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					6.40E-02	J				ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					1.50E-01	J			YES	ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	8.40E-02	J				2.70E-01	J				ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	1.20E-01	J		YES	YES	3.20E-01	J			YES	YES	ND				ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	1.40E-01	J				6.00E-01					ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	4.20E-02	J				1.50E-01	J				ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	1.70E-01	J				6.40E-01					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	1.60E-01	J				4.40E-01	J				ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					9.00E-02	J			YES	ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	2.40E-01	J			YES	3.70E-01	J				ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	4.70E-02	J				1.60E-01	J				ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					4.50E-02	J				ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	1.90E-01	J			YES	3.90E-01	J				ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	9.00E-02	B				3.70E-01	B				1.60E-01	J				1.10E-01	J			

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-GP02 BX0017 11-Nov-99 0- 1					GSBP-501 GSBP-501-GP03 BX0019 11-Nov-99 0- 1					GSBP-501 GSBP-501-GP04 BX0021 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW01 BX0001 10-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	8.57E+03			YES	YES	5.85E+03				YES	7.35E+03				YES	9.42E+03	U		YES	YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	4.60E+00	J		YES		3.40E+00	J		YES		4.00E+00	J		YES		2.60E+00	J		YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	3.81E+01					2.66E+01					8.31E+01					5.70E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	3.90E-01	B				3.00E-01	B				5.70E-01	B				5.30E-01	B			
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	1.70E+00		YES		YES	ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	1.06E+03	J				8.39E+02	J				9.22E+02	J				2.52E+04	J	YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.10E+01	J			YES	1.58E+01	J			YES	1.08E+01	J			YES	1.21E+01	J			YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	5.10E+00	J				3.40E+00	J				5.50E+00	J				2.80E+00	J			
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	4.40E+00	J				3.30E+00	J				4.70E+00	J				3.40E+00	J			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.33E+04			YES	YES	9.21E+03			YES	YES	1.56E+04			YES	YES	7.00E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.95E+01					4.59E+01		YES			1.37E+01					8.80E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	6.14E+02	J				3.70E+02	J				2.69E+02	J				2.14E+03	J	YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	3.21E+02	J			YES	2.89E+02	J			YES	8.29E+02	J		YES	YES	2.19E+02	J			YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	6.80E-02					5.80E-02					5.40E-02					3.90E-02	B			
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	4.60E+00					2.80E+00	J				5.10E+00					5.70E+00				
Potassium	mg/kg	8.00E+02	NA	NA	2.55E+02	J				1.68E+02	J				2.11E+02	J				4.92E+02	J			
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					ND					1.81E+02	J			
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	ND					ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	2.44E+01				YES	1.70E+01				YES	2.67E+01				YES	2.01E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	2.22E+01	J				9.40E+01	J	YES		YES	1.24E+01	J				1.51E+01	J			
<b>VOLATILE ORGANIC COMPOUNDS</b>																								
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	1.00E-01	ND					ND					7.20E-04	B				ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					1.40E-02	J				ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					3.90E-03	J				8.20E-04	J			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					5.40E-03	J				ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					5.60E-03	J				1.50E-02	UJ			
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					ND					4.70E-03	J			
Acetone	mg/kg	NA	7.76E+02	2.50E+00	ND					9.70E-03	B				2.60E-02	B				7.30E-02	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					ND					ND					8.00E-04	UJ			
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					ND					ND					8.70E-04	J			
Cumene	mg/kg	NA	7.77E+02	NA	ND					ND					6.00E-04	J				ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					1.50E-03	J				8.50E-04	J			
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	6.00E-03	B				5.40E-03	B				8.30E-03	B				7.60E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					6.40E-03	J				ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					1.10E-03	J				2.30E-03	J				1.90E-03	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					1.30E-03	J				2.50E-03	J			
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	ND					2.30E-03	J			YES	3.60E-03	J			YES	2.90E-03	J			YES
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					2.30E-03	J				ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					5.60E-03	J				1.80E-03	J			
n-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					2.20E-03	J				ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					1.00E-03	J				ND				
o-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					1.80E-03	J				ND				
p-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					6.70E-04	J				ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					ND					ND				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-GP02 BX0017 11-Nov-99 0- 1					GSBP-501 GSBP-501-GP03 BX0019 11-Nov-99 0- 1					GSBP-501 GSBP-501-GP04 BX0021 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW01 BX0001 10-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																								
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					ND					ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					ND					ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					ND					ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					ND					ND					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					ND					ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					ND					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					ND					ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					ND					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					ND					ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					ND					ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	8.80E-02	J				5.50E-02	J				5.60E-02	J				ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 8)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-MW02 BX0003 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW03 BX0007 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW04 BX0009 10-Nov-99 0- 1					GSBP-501 GSBP-501-MW05 BX0011 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	3.85E+03				YES	5.04E+03				YES	5.53E+03				YES	6.87E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.70E+00	J		YES		2.90E+00	J		YES		3.50E+00	J		YES		3.60E+00	J		YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	2.96E+01					3.36E+01					3.00E+01					7.17E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	3.80E-01	B				4.60E-01	B				4.20E-01	B				6.90E-01	J			
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND					ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	5.54E+02	J				2.04E+03	J	YES			7.05E+02	J				1.75E+03	J	YES		
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.01E+01	J		YES		7.50E+00	J			YES	2.35E+01	J		YES	YES	2.77E+01	J		YES	YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	2.60E+00	J				5.10E+00	J				5.40E+00	J				6.70E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	1.50E+00	B				4.70E+00	J				4.40E+00	J				2.80E+00	B			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	6.99E+03			YES	YES	8.81E+03			YES	YES	1.21E+04			YES	YES	9.75E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	6.50E+00					1.02E+01					1.00E+01					1.41E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	2.72E+02	J				1.17E+03	J	YES			3.47E+02	J				6.05E+02	J			
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.91E+02	J		YES		2.48E+02	J			YES	4.17E+02	J		YES	YES	1.15E+03	J		YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	2.60E-02	J				4.70E-02					7.40E-02					3.40E-02	J			
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	2.20E+00	J				4.20E+00	J				3.30E+00	J				4.00E+00	J			
Potassium	mg/kg	8.00E+02	NA	NA	9.37E+01	J				2.27E+02	J				1.33E+02	J				1.90E+02	J			
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					ND					ND				
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	ND					ND					ND					6.30E-01	J		YES	
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.36E+01				YES	1.45E+01				YES	1.92E+01	J			YES	1.68E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	5.50E+00	J				1.18E+01	J				9.80E+00	J				1.04E+01	J			
<b>VOLATILE ORGANIC COMPOUNDS</b>																								
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	1.00E-01	ND					ND					ND					ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					9.80E-04	J				ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					ND					ND				
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND					ND					ND					ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					ND					ND					ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND					ND					3.60E-03	J				ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	9.30E-03	B				7.50E-03	B				1.20E-02	B				7.90E-03	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND					ND					ND					ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND					ND					ND					ND				
Cumene	mg/kg	NA	7.77E+02	NA	ND					ND					ND					ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND					ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	5.10E-03	B				6.80E-03	B				5.90E-03	B				6.50E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	9.00E-04	J				8.30E-04	J				1.50E-03	J				1.80E-03	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					1.10E-03	J				ND				
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	9.40E-04	J				8.90E-04	J				1.90E-03	J			YES	3.00E-03	J			YES
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					ND					ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND					ND					2.20E-03	J				ND				
n-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
o-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
p-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND					ND					ND					ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					ND					ND				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-MW02 BX0003 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW03 BX0007 11-Nov-99 0- 1					GSBP-501 GSBP-501-MW04 BX0009 10-Nov-99 0- 1					GSBP-501 GSBP-501-MW05 BX0011 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																								
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND					ND					ND					ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND					ND					ND					ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND					ND					ND					ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND					ND					ND					ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND					ND					ND					ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND					ND					ND					ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND					ND					ND					ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND					ND					ND					ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND					ND					ND					ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND					ND					ND					ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND					ND					ND					ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND					ND					ND					ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND					ND					ND					ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	4.90E-02 J					6.30E-02 J					ND					4.10E-02 J				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-MW06 BX0013 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV
<b>METALS</b>									
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	7.15E+03				YES
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	5.00E+00	J		YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	9.03E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	1.10E+00	J	YES		YES
Cadmium	mg/kg	2.90E-01	6.25E+00	1.60E+00	ND				
Calcium	mg/kg	1.72E+03	NA	NA	9.67E+02	J			
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	8.20E+00	J			YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	4.30E+00	J			
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	3.00E+00	B			
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.63E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.76E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	2.46E+02	J			
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.46E+03	J		YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	6.50E-02				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	4.20E+00	J			
Potassium	mg/kg	8.00E+02	NA	NA	1.54E+02	J			
Sodium	mg/kg	6.34E+02	NA	NA	ND				
Thallium	mg/kg	3.43E+00	5.08E-01	1.00E+00	8.40E-01	J		YES	
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	2.42E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	9.40E+00	J			
<b>VOLATILE ORGANIC COMPOUNDS</b>									
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	1.00E-01	ND				
1,2,4-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND				
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	5.00E-02	8.60E-04	J			
1,3,5-Trimethylbenzene	mg/kg	NA	3.88E+02	1.00E-01	ND				
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND				
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	4.43E+02	ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.80E-02	B			
Benzene	mg/kg	NA	2.17E+01	5.00E-02	ND				
Carbon disulfide	mg/kg	NA	7.77E+02	9.00E-02	ND				
Cumene	mg/kg	NA	7.77E+02	NA	ND				
Ethylbenzene	mg/kg	NA	7.77E+02	5.00E-02	ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	5.60E-03	B			
Naphthalene	mg/kg	NA	1.55E+02	1.00E-01	ND				
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	2.30E-03	J			
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND				
Trichloroethene	mg/kg	NA	5.72E+01	1.00E-03	2.10E-03	J			YES
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND				
m,p-Xylenes	mg/kg	NA	1.55E+04	5.00E-02	ND				
n-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND				
n-Propylbenzene	mg/kg	NA	7.77E+01	NA	ND				
o-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND				
p-Chlorotoluene	mg/kg	NA	1.55E+02	1.00E-01	ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND				

Table 5-1

**Surface and Depositional Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

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Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)					GSBP-501 GSBP-501-MW06 BX0013 11-Nov-99 0- 1				
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	ESV <sup>b</sup>	Result	Qual	>BKG	>SSSL	>ESV
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>									
Acenaphthylene	mg/kg	8.91E-01	4.63E+02	6.82E+02	ND				
Anthracene	mg/kg	9.35E-01	2.33E+03	1.00E-01	ND				
Benzo(a)anthracene	mg/kg	1.19E+00	8.51E-01	5.21E+00	ND				
Benzo(a)pyrene	mg/kg	1.42E+00	8.51E-02	1.00E-01	ND				
Benzo(b)fluoranthene	mg/kg	1.66E+00	8.51E-01	5.98E+01	ND				
Benzo(ghi)perylene	mg/kg	9.55E-01	2.32E+02	1.19E+02	ND				
Benzo(k)fluoranthene	mg/kg	1.45E+00	8.51E+00	1.48E+02	ND				
Chrysene	mg/kg	1.40E+00	8.61E+01	4.73E+00	ND				
Dibenz(a,h)anthracene	mg/kg	7.20E-01	8.61E-02	1.84E+01	ND				
Fluoranthene	mg/kg	2.03E+00	3.09E+02	1.00E-01	ND				
Indeno(1,2,3-cd)pyrene	mg/kg	9.37E-01	8.51E-01	1.09E+02	ND				
Phenanthrene	mg/kg	1.08E+00	2.32E+03	1.00E-01	ND				
Pyrene	mg/kg	1.63E+00	2.33E+02	1.00E-01	ND				
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	6.60E-02	J			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July. For SVOCs, value listed is the background screening criterion for soils adjacent to asphalt as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

acetone and methylene chloride results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. All but one of the remaining VOC results were flagged with a “J” data qualifier signifying that the result was greater than the method detection limit (MDL) but less than the RL. Sample locations GSBP-501-GP04 and GSBP-501-MW01 contained nineteen and twelve VOCs, respectively, of the twenty-four detected VOCs.

The VOC concentrations in surface and depositional soils were below SSSLs. Trichloroethene (TCE) concentrations exceeded the ESV at seven sample locations. The cumulative TCE concentration in the surface and depositional soil samples collected was 0.0192 mg/kg.

**Semivolatile Organic Compounds.** Fourteen SVOCs, including thirteen PAH compounds and one non-PAH compound (bis[2-ethylhexyl]phthalate), were detected in surface and depositional soil samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). SVOCs were not detected at two sample locations and bis(2-ethylhexyl)phthalate was the only detected SVOC at nine additional locations. Sample locations GSBP-501-DEP02 and GSBP-501-DEP01 contained fourteen and ten SVOCs, respectively, of the fourteen detected SVOCs.

The concentrations of benzo(a)pyrene (GSBP-501-DEP01 and GSBP-501-DEP02) and dibenz(a,h)anthracene (GSBP-501-DEP02) exceeded SSSLs but were below PAH background values for soils adjacent to asphalt. The concentrations of four PAH compounds (anthracene, benzo[a]pyrene, fluoranthene, and pyrene) exceeded ESVs in two of the samples (GSBP-501-DEP01 and/or GSBP-501-DEP02) but were below PAH background values.

## **5.2 Subsurface Soil Analytical Results**

Ten subsurface soil samples were collected for chemical analyses at the Buildings South of Reilly Airfield, Parcel 501(7). Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-2.

**Metals.** Eighteen metals were detected in subsurface soil samples collected at the site. With the exception of thallium, which was detected in only one sample, each of the detected metals was present in each of the samples.

Table 5-2

**Subsurface Soil Analytical Results**  
**Buildings South of Reilly Airfield, Parcel 501(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				GSBP-501 GSBP-501-GP01 BX0016 11-Nov-99 10-12				GSBP-501 GSBP-501-GP02 BX0018 11-Nov-99 10-12				GSBP-501 GSBP-501-GP03 BX0020 11-Nov-99 10-12				GSBP-501 GSBP-501-GP04 BX0022 11-Nov-99 10-11				GSBP-501 GSBP-501-MW01 BX0002 10-Nov-99 10-12			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																							
Aluminum	mg/kg	1.36E+04	7.80E+03	5.80E+03				5.03E+03				8.15E+03			YES	3.50E+03				6.37E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	4.60E+00	J		YES	4.30E+00	J		YES	1.15E+01	J		YES	9.00E-01	B		YES	4.50E+00	J		YES
Barium	mg/kg	2.34E+02	5.47E+02	2.25E+01	J			1.83E+01	J			2.89E+01				2.74E+01				5.38E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	4.80E-01	B			3.40E-01	B			9.40E-01	J	YES		4.60E-01	B			1.00E+00	J	YES	
Calcium	mg/kg	6.37E+02	NA	3.90E+02	J			5.59E+02	J			1.33E+02	J			3.20E+02	J			5.39E+02	J		
Chromium	mg/kg	3.83E+01	2.32E+01	8.70E+00	J			1.16E+01	J			2.06E+01	J			4.90E+00	J			1.65E+01	J		
Cobalt	mg/kg	1.75E+01	4.68E+02	1.70E+00	J			1.20E+00	J			7.00E+00				3.90E-01	J			2.90E+00	J		
Copper	mg/kg	1.94E+01	3.13E+02	3.90E+00	J			2.00E+00	B			7.80E+00	J			1.00E+00	B			3.90E+00	J		
Iron	mg/kg	4.48E+04	2.34E+03	1.62E+04			YES	1.39E+04			YES	4.54E+04		YES	YES	8.45E+02				1.18E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	6.00E+00				7.90E+00				2.05E+01				7.20E+00				1.96E+01			
Magnesium	mg/kg	7.66E+02	NA	2.77E+02	J			2.08E+02	J			1.73E+02	J			2.92E+02	J			4.90E+02	J		
Manganese	mg/kg	1.36E+03	3.63E+02	3.89E+01	J			1.59E+01	J			2.02E+02	J			3.00E+00	J			3.28E+01	J		
Mercury	mg/kg	7.00E-02	2.33E+00	4.70E-02				4.10E-02				6.80E-02				3.50E-02	J			1.20E-01		YES	
Nickel	mg/kg	1.29E+01	1.54E+02	2.60E+00	J			1.70E+00	J			4.20E+00	J			1.50E+00	J			3.20E+00	J		
Potassium	mg/kg	7.11E+02	NA	3.50E+02	J			1.95E+02	J			2.04E+02	J			4.10E+01	J			2.10E+02	J		
Thallium	mg/kg	1.40E+00	5.08E-01	ND				ND				ND				ND				1.20E+00			YES
Vanadium	mg/kg	6.49E+01	5.31E+01	2.25E+01				2.62E+01				4.63E+01				4.60E+00	J			4.51E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	8.20E+00	J			5.40E+00	J			1.47E+01	J			3.80E+00	J			7.30E+00	J		
<b>VOLATILE ORGANIC COMPOUNDS</b>																							
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	7.20E-04	B			ND				ND				ND				ND			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	ND				ND				ND				ND				ND			
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	ND				ND				ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	1.00E-02	B			1.00E-02	B			8.20E-03	B			8.00E-03	B			1.20E-02	B		
Methylene chloride	mg/kg	NA	8.41E+01	6.50E-03	B			6.20E-03	B			5.70E-03	B			6.50E-03	B			5.00E-03	B		
Tetrachloroethene	mg/kg	NA	1.21E+01	1.50E-03	J			1.40E-03	J			1.20E-03	J			1.20E-03	J			1.10E-03	J		
Trichloroethene	mg/kg	NA	5.72E+01	2.30E-03	J			1.50E-03	J			1.40E-03	J			1.00E-03	J			1.40E-03	J		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																							
Diethyl phthalate	mg/kg	NA	6.23E+03	ND				ND				ND				ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	5.60E-02	J			6.60E-02	J			5.00E-02	J			4.90E-02	J			ND			

Table 5-2

**Subsurface Soil Analytical Results  
Buildings South of Reilly Airfield, Parcel 501(7)  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Parcel Sample Location Sample Number Sample Date Sample Depth (Feet)				GSBP-501 GSBP-501-MW02 BX0004 11-Nov-99 10-12				GSBP-501 GSBP-501-MW03 BX0008 11-Nov-99 10-12				GSBP-501 GSBP-501-MW04 BX0010 10-Nov-99 10-12				GSBP-501 GSBP-501-MW05 BX0012 11-Nov-99 10-12				GSBP-501 GSBP-501-MW06 BX0014 11-Nov-99 10-12			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																							
Aluminum	mg/kg	1.36E+04	7.80E+03	3.72E+03				1.00E+04			YES	4.59E+03				4.97E+03				5.63E+03			
Arsenic	mg/kg	1.83E+01	4.26E-01	3.60E+00	J		YES	1.08E+01	J		YES	1.50E+01	J		YES	6.00E+00	J		YES	4.50E+00	J		YES
Barium	mg/kg	2.34E+02	5.47E+02	1.37E+01	J			2.95E+01				9.70E+00	J			1.30E+01	J			5.58E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	3.90E-01	B			8.80E-01	J	YES		7.00E-01	J			4.40E-01	B			1.10E+00	J	YES	
Calcium	mg/kg	6.37E+02	NA	2.71E+02	J			5.12E+02	J			2.64E+02	J			2.69E+01	J			4.83E+02	J		
Chromium	mg/kg	3.83E+01	2.32E+01	1.30E+01	J			2.56E+01	J		YES	3.07E+01	J		YES	1.12E+01	J			3.35E+01	J		YES
Cobalt	mg/kg	1.75E+01	4.68E+02	3.40E+00	J			1.55E+01				4.40E+00	J			5.00E+00	J			1.80E+00	J		
Copper	mg/kg	1.94E+01	3.13E+02	3.60E+00	J			8.10E+00	J			5.40E+00	J			3.90E+00	J			7.80E+00	J		
Iron	mg/kg	4.48E+04	2.34E+03	1.22E+04			YES	3.77E+04			YES	3.02E+04			YES	2.70E+04			YES	1.82E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	1.11E+01				3.09E+01				2.05E+01				1.49E+01				1.22E+01			
Magnesium	mg/kg	7.66E+02	NA	1.97E+02	J			4.23E+02	J			1.57E+02	J			1.07E+02	J			3.60E+02	J		
Manganese	mg/kg	1.36E+03	3.63E+02	9.79E+01	J			2.81E+02	J			7.40E+01	J			1.69E+02	J			1.81E+01	J		
Mercury	mg/kg	7.00E-02	2.33E+00	4.70E-02				1.10E-01		YES		4.50E-02				3.80E-02				1.40E-01		YES	
Nickel	mg/kg	1.29E+01	1.54E+02	3.60E+00	J			5.20E+00				4.20E+00	J			2.70E+00	J			2.70E+00	J		
Potassium	mg/kg	7.11E+02	NA	1.39E+02	J			3.02E+02	J			9.42E+01	J			1.53E+02	J			8.57E+01	J		
Thallium	mg/kg	1.40E+00	5.08E-01	ND				ND				ND				ND				ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	2.36E+01				5.44E+01			YES	3.63E+01				2.88E+01				5.73E+01			YES
Zinc	mg/kg	3.49E+01	2.34E+03	1.15E+01	J			1.68E+01	J			1.71E+01	J			1.27E+01	J			1.17E+01	J		
<b>VOLATILE ORGANIC COMPOUNDS</b>																							
1,1,1-Trichloroethane	mg/kg	NA	1.55E+03	ND				ND				ND				ND				ND			
1,2-Dimethylbenzene	mg/kg	NA	1.55E+04	ND				ND				ND				ND				6.50E-04	J		
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	ND				3.60E-03	J			ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	7.80E-03	B			1.10E-02	B			9.50E-03	B			9.20E-03	B			9.80E-03	B		
Methylene chloride	mg/kg	NA	8.41E+01	4.70E-03	B			5.30E-03	B			5.60E-03	B			5.80E-03	B			5.10E-03	B		
Tetrachloroethene	mg/kg	NA	1.21E+01	8.80E-04	J			1.10E-03	J			1.90E-03	J			2.20E-03	J			1.70E-03	J		
Trichloroethene	mg/kg	NA	5.72E+01	8.70E-04	J			1.20E-03	J			2.50E-03	J			3.20E-03	J			1.50E-03	J		
<b>SEMIVOLATILE ORGANIC COMPOUNDS</b>																							
Diethyl phthalate	mg/kg	NA	6.23E+03	ND				ND				2.60E-01	J			ND				ND			
bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	ND				5.40E-02	J			5.10E-02	J			5.10E-02	J			5.80E-02	J		

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

The concentrations of six metals (aluminum, arsenic, chromium, iron, thallium, and vanadium) exceeded SSSLs. With the exception of iron at GSBP-501-GP03, the concentrations of these metals were below the respective background concentration. The iron result at GSBP-501-GP03 was within the range of background values determined by SAIC (1998) (Appendix H).

***Volatile Organic Compounds.*** Seven VOCs, including 1,1,1-trichloroethane (TCA), 1,2-dimethylbenzene, 4-methyl-2-pentanone, acetone, methylene chloride, tetrachloroethene, and TCE, were detected in subsurface soil samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). The 1,1,1-TCA, acetone, and methylene chloride results were flagged with a “B” data qualifier signifying that these compounds were also detected in an associated laboratory or field blank. The remaining VOC results were flagged with a “J” data qualifier signifying that the results were greater than the MDL but less than the RL. The VOCs 1,1,1-TCA (GSBP-501-GP01), 1,2-dimethylbenzene (GSBP-501-MW06), and 4-methyl-2-pentanone (GSBP-501-MW03) were each detected in only one of the samples.

The concentrations of VOCs in subsurface soils were below SSSLs.

***Semivolatile Organic Compounds.*** Two SVOCs (diethyl phthalate and bis[2-ethylhexyl]phthalate) were detected in subsurface soil samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). The analytical results were flagged with a “J” data qualifier signifying that the results were greater than the MDL but less than the RL. Diethyl phthalate was detected in only one of the samples (GSBP-501-MW04).

The diethyl phthalate and bis(2-ethylhexyl)phthalate concentrations in subsurface soils were below SSSLs.

### **5.3 Groundwater Analytical Results**

Six permanent monitoring wells were sampled at the Buildings South of Reilly Airfield, Parcel 501(7), at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-3.

***Metals.*** Twenty metals were detected in groundwater samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). The sample collected at GSBP-501-MW02 contained nineteen of the twenty detected metals.

Table 5-3

**Groundwater Analytical Results**  
**Buildings South of Reilly Airfield, Parcel 501(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

Parcel Sample Location Sample Number Sample Date				GSBP-501 GSBP-501-MW01 BX3001 5-Jan-00				GSBP-501 GSBP-501-MW02 BX3004 5-Jan-00				GSBP-501 GSBP-501-MW02 BX3004R 7-Jul-00				GSBP-501 GSBP-501-MW03 BX3005 5-Jan-00			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>																			
Aluminum	mg/L	2.34E+00	1.56E+00	1.34E+00				4.93E+01		YES	YES	6.24E-01				4.70E-01			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				4.51E-02		YES	YES	ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	3.90E-02	J			2.40E-01		YES	YES	1.76E-02				1.19E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				9.20E-03		YES	YES	ND				ND			
Cadmium	mg/L	2.51E-03	7.80E-04	ND				1.00E-03	J		YES	ND				ND			
Calcium	mg/L	5.65E+01	NA	2.45E+01				4.97E+01				4.01E+01				7.45E+00			
Chromium	mg/L	NA	4.69E-03	1.80E-03	J			6.70E-02			YES	ND				2.70E-03	J		
Cobalt	mg/L	2.34E-02	9.39E-02	ND				2.35E-02	J	YES		ND				ND			
Copper	mg/L	2.55E-02	6.26E-02	ND				5.82E-02	J	YES		9.50E-03				ND			
Iron	mg/L	7.04E+00	4.69E-01	1.87E+00			YES	7.23E+01		YES	YES	5.62E-01			YES	5.98E-01			YES
Lead	mg/L	7.99E-03	1.50E-02	2.60E-03	J			1.87E-01		YES	YES	ND				ND			
Magnesium	mg/L	2.13E+01	NA	1.56E+01				3.13E+01		YES		2.28E+01		YES		4.73E+00	J		
Manganese	mg/L	5.81E-01	7.35E-02	2.44E-01			YES	3.67E+00		YES	YES	9.82E-02			YES	6.12E-02			
Mercury	mg/L	NA	4.60E-04	ND				1.30E-03			YES	ND				ND			
Nickel	mg/L	NA	3.13E-02	ND				5.34E-02			YES	5.70E-03				2.00E-03	J		
Potassium	mg/L	7.20E+00	NA	5.03E-01	J			4.65E+00	J			4.72E-01				4.01E-01	J		
Selenium	mg/L	NA	7.82E-03	ND				ND				ND				ND			
Sodium	mg/L	1.48E+01	NA	5.89E+00				2.72E+00	J			2.75E+00				1.05E+00	J		
Vanadium	mg/L	1.70E-02	1.10E-02	4.80E-03	J			3.06E-01		YES	YES	3.90E-03				ND			
Zinc	mg/L	2.20E-01	4.69E-01	1.02E-02	J			2.90E-01		YES		2.03E-02				4.10E-03	J		
<b>VOLATILE ORGANIC COMPOUNDS</b>																			
Acetone	mg/L	NA	1.56E-01	9.70E-04	B			5.40E-04	B			NR				ND			
Chloroform	mg/L	NA	1.15E-03	ND				ND				NR				ND			
Chloromethane	mg/L	NA	3.92E-03	1.60E-04	B			1.80E-04	B			NR				ND			

Table 5-3

**Groundwater Analytical Results**  
**Buildings South of Reilly Airfield, Parcel 501(7)**  
**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

Parcel Sample Location Sample Number Sample Date				GSBP-501 GSBP-501-MW04 BX3006 5-Jan-00				GSBP-501 GSBP-501-MW05 BX3007 4-Jan-00				GSBP-501 GSBP-501-MW06 BX3008 4-Jan-00			
Parameter	Units	BKG <sup>a</sup>	SSSL <sup>b</sup>	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
<b>METALS</b>															
Aluminum	mg/L	2.34E+00	1.56E+00	2.94E-01	B			4.08E-01				8.40E-01			
Arsenic	mg/L	1.78E-02	4.00E-05	ND				ND				ND			
Barium	mg/L	1.27E-01	1.10E-01	5.96E-02	J			3.53E-02	J			8.19E-02	J		
Beryllium	mg/L	1.24E-03	3.12E-03	ND				ND				ND			
Cadmium	mg/L	2.51E-03	7.80E-04	ND				ND				ND			
Calcium	mg/L	5.65E+01	NA	1.07E+01				3.87E+01				1.02E+01			
Chromium	mg/L	NA	4.69E-03	2.40E-03	J			1.80E-03	J			1.40E-03	J		
Cobalt	mg/L	2.34E-02	9.39E-02	ND				ND				8.20E-03	J		
Copper	mg/L	2.55E-02	6.26E-02	ND				ND				ND			
Iron	mg/L	7.04E+00	4.69E-01	6.30E-01			YES	4.57E-01				3.17E+00			YES
Lead	mg/L	7.99E-03	1.50E-02	ND				ND				ND			
Magnesium	mg/L	2.13E+01	NA	5.71E+00				2.24E+01		YES		6.80E+00			
Manganese	mg/L	5.81E-01	7.35E-02	1.47E-01			YES	2.26E-02				7.89E-01		YES	YES
Mercury	mg/L	NA	4.60E-04	ND				ND				ND			
Nickel	mg/L	NA	3.13E-02	2.60E-03	J			ND				3.20E-03	J		
Potassium	mg/L	7.20E+00	NA	7.03E-01	J			6.95E-01	J			ND			
Selenium	mg/L	NA	7.82E-03	ND				ND				5.20E-03			
Sodium	mg/L	1.48E+01	NA	1.65E+00	J			1.33E+00	J			1.83E+01		YES	
Vanadium	mg/L	1.70E-02	1.10E-02	ND				2.00E-03	J			2.80E-03	J		
Zinc	mg/L	2.20E-01	4.69E-01	4.40E-03	J			3.00E-03	J			8.70E-03	J		
<b>VOLATILE ORGANIC COMPOUNDS</b>															
Acetone	mg/L	NA	1.56E-01	4.90E-04	B			ND				ND			
Chloroform	mg/L	NA	1.15E-03	ND				2.90E-04	J			ND			
Chloromethane	mg/L	NA	3.92E-03	2.10E-04	B			1.40E-04	J			ND			

Analyses performed by Quanterra Environmental Services using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods, including Update III methods where applicable.

<sup>a</sup> Bkg - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in Science Applications International Corporation (1998), *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

<sup>b</sup> Residential human health site-specific screening level (SSSL) as given in IT Corporation (2000), *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero).

J - Result is greater than stated method detection limit but less than or equal to specified reporting limit.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

NR - Analysis not requested.

Qual - Data validation qualifier.

The concentrations of eight metals (aluminum, arsenic, barium, beryllium, iron, lead, manganese, and vanadium) exceeded SSSLs and background concentrations. However, with the exception of manganese in GSBP-501-MW06, the metals that exceeded SSSLs and background concentrations were present in GSBP-501-MW02. (At the time of sample collection, the turbidity was greater than 1,000 NTUs.) The manganese result at GSBP-501-MW06 was within the range of background values determined by SAIC (1998).

Monitoring well GSBP-501-MW02 was resampled on July 7, 2000 as part of the groundwater resampling study to evaluate the effect of elevated turbidity on metals concentrations (IT, 2000c). The turbidity in the resample was reduced below 10 NTUs using a low-flow sample technique. The resample results indicate that two metals (iron and manganese) exceeded SSSLs but were below background concentrations.

***Volatile Organic Compounds.*** Three VOCs, including acetone, chloroform, and chloromethane, were detected in groundwater samples collected at the Buildings South of Reilly Airfield, Parcel 501(7). The acetone results and three of the four chloromethane results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank. Chloroform was detected in only one of the samples (GSBP-501-MW05).

The VOC concentrations in groundwater were below SSSLs.

***Semivolatile Organic Compounds.*** SVOCs were not detected in the groundwater samples collected at the Buildings South of Reilly Airfield, Parcel 501(7).

## **6.0 Summary and Conclusions and Recommendations**

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IT, under contract with USACE, completed an SI at the Buildings South of Reilly Airfield, Parcel 501(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site at concentrations that would present an unacceptable risk to human health or the environment. The SI at the Buildings South of Reilly Airfield, Parcel 501(7), consisted of the sampling and analyses of ten surface soil samples, three depositional soil samples, ten subsurface soil samples, and six groundwater samples. In addition, six permanent monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and provide site-specific geological and hydrogeological characterization information.

Chemical analyses of samples collected at the Buildings South of Reilly Airfield, Parcel 501(7), indicate that metals, VOCs, and SVOCs have been detected in the various site media. Analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC environmental restoration program at FTMC. Additionally, metal concentrations exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998), and SVOC concentrations exceeding SSSLs and ESVs in surface and depositional soils were compared to PAH background screening values, where available (IT, 2000b).

The potential threat to human receptors is expected to be low. Although the site is projected for industrial use, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future land use. In soils, the concentrations of eight metals (aluminum, arsenic, chromium, iron, lead, manganese, thallium, and vanadium) exceeded SSSLs. However, with the exception of lead at one sample location (GSBP-501-DEP01), the concentrations of the metals that exceeded SSSLs were below the respective background concentration or within the range of background values. The lead concentration (480 mg/kg) at GSBP-501-DEP01 marginally exceeded the residential human health SSSL (400 mg/kg). Two SVOCs (PAH compounds) were detected in two depositional soil samples at concentrations exceeding SSSLs but below PAH background values.

Four metals (beryllium, cadmium, lead, and zinc) were detected in surface and depositional soils (primarily in one sample [GSBP-501-DEP02]) at concentrations exceeding ESVs and the range of background values. The concentrations of four SVOCs (PAH compounds) exceeded ESVs in two depositional soil samples but were below PAH background values. In addition, one VOC (TCE) was detected in seven surface soil samples at concentrations exceeding the ESV. The cumulative TCE concentration in the surface and depositional soil samples collected was 0.0192 mg/kg. However, the potential impact to ecological receptors is expected to be minimal based on site conditions. Nearly the entire site is covered with asphalt/concrete pavement and a few small buildings with limited grassy areas. The site does not currently support viable ecological habitat and is not expected to support ecological habitat in the projected (industrial) land-use scenario.

Based on the results of the SI, past operations at the Buildings South of Reilly Airfield, Parcel 501(7), do not appear to have adversely impacted the environment. The metals and chemical constituents detected in site media do not pose an unacceptable risk to human health and the environment. Therefore, IT recommends “No Further Action” and unrestricted reuse with regard to hazardous, toxic, and radioactive waste, at the Buildings South of Reilly Airfield, Parcel 501(7).

## 7.0 References

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**ATTACHMENT 1**

**LIST OF ABBREVIATIONS AND ACRONYMS**

# List of Abbreviations and Acronyms

Abs	skin absorption
AC	hydrogen cyanide
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded
ACGIH	American Conference of Governmental Industrial Hygienists
ADEM	Alabama Department of Environmental Management
AEL	airborne exposure limit
AL	Alabama
amb.	Amber
ANAD	Anniston Army Depot
APT	armor piercing tracer
ASP	Ammunition Supply Point
ASR	Archives Search Report, July 1999
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
B	analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)
BCT	BRAC Cleanup Team
BFB	bromofluorobenzene
bgs	below ground surface
bkg	background
bls	below land surface
BOD	biological oxygen demand
BRAC	Base Realignment and Closure
Braun	Braun Intertec Corporation
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTOC	below top of casing
BZ	breathing zone
C	ceiling limit value
Ca	carcinogen
CCAL	continuing calibration
CCB	continuing calibration blank
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CFC	chlorofluorocarbon
CG	cyanogen chloride
ch	inorganic clays of high plasticity
CK	carbonyl chloride
cl	inorganic clays of low to medium plasticity
Cl.	chlorinated
CLP	Contract Laboratory Program
CN	chloroacetophenone
CNB	chloroacetophenone, benzene, and carbon tetrachloride
CNS	chloroacetophenone, chloropicrin, and chloroform
COC	chain of custody

COE	Corps of Engineers
Con	skin or eye contact
CRL	certified reporting limit
CRZ	contamination reduction zone
CS	ortho-chlorobenzylidene-malononitrile
CSEM	conceptual site exposure model
ctr.	container
CWA	chemical warfare agent
CWM	chemical warfare materials, clear wide mouth
CX	dichloroformoxime
D	duplicate
DANC	decontamination agent, non-corrosive
°C	degrees Celsius
°F	degrees Fahrenheit
DDT	dichlorodiphenyltrichloroethane
DEP	depositional soil
DI	deionized
DIMP	di-isopropylmethylphosphonate
DMMP	dimethylmethylphosphonate
DOD	U.S. Department of Defense
DP	direct-push
DPDO	Defense Property Disposal Office
DQO	data quality objective
DRMO	Defense Reutilization and Marketing Office
DS	deep (subsurface) soil
DS2	Decontamination Solution Number 2
E&E	Ecology and Environment, Inc.
EBS	environmental baseline survey
Elev.	elevation
EM	electromagnetic
EM31	Geonics Limited EM31 Terrain Conductivity Meter
EM61	Geonics Limited EM61 High-Resolution Metal Detector
EOD	explosive and ordnance disposal
EODT	explosive and ordnance disposal team
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
EPIC	Environmental Photographic Interpretation Center
ER	equipment rinsate
ESE	Environmental Science and Engineering, Inc.
ESV	ecological screening value
E-W	east to west
EZ	exclusion zone
FB	field blank
FD	field duplicate
FedEx	Federal Express, Inc.
FFE	field flame expedient
Fil	filtered
Flt	filtered

FMP 1300	Former Motor Pool 1300 Site
Frtn	fraction
FS	field split
ft	feet
ft/ft	feet per foot
FTA	fire training area
FTMC	Fort McClellan
g	gram
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GFAA	graphite furnace atomic absorption
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar
GPS	global positioning system
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
Herb.	herbicides
HNO <sub>3</sub>	nitric acid
hr	hour
H&S	health and safety
HSA	hollow stem auger
HTRW	hazardous, toxic, and radioactive waste
I	out of control, data rejected due to low recovery
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDW	investigation-derived waste
IMPA	isopropylmethyl phosphonic acid
in.	inch
Ing	ingestion

**List of Abbreviations and Acronyms (Continued)**

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Inh	inhalation	ND	not detected	qty	quantity
IP	ionization potential	NE	no evidence	Qual	qualifier
IPS	International Pipe Standard	NFA	No Further Action	R	rejected
IRDMIS	Installation Restoration Data Management Information System	ng/L	nanograms per liter	RCRA	Resource Conservation and Recovery Act
IT	IT Corporation	NGVD	National Geodetic Vertical Datum	ReB3	Rarden silty clay loams
ITEMS	IT Environmental Management System <sup>TM</sup>	NIC	notice of intended change	REG	field sample
J	estimated concentration	NIOSH	National Institute for Occupational Safety and Health	REL	recommended exposure limit
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded	No.	number	RFA	request for analysis
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded	NOAA	National Oceanic and Atmospheric Administration	RI	remedial investigation
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes	NR	not requested	RL	reporting limit
K	conductivity	ns	nanosecond	RPD	relative percent difference
L	lewisite; liter	N-S	north to south	RRF	relative response factor
LC <sub>50</sub>	lethal concentration for 50 percent of population tested	nT	nanotesla	RSD	relative standard deviation
LD <sub>50</sub>	lethal dose for 50 percent of population tested	NTU	nephelometric turbidity unit	RTK	real-time kinematic
l	liter	O&G	oil and grease	SAD	South Atlantic Division
LCS	laboratory control sample	OD	outside diameter	SAE	Society of Automotive Engineers
LEL	lower explosive limit	OE	ordnance and explosives	SAIC	Science Applications International Corporation
LT	less than the certified reporting limit	oh	organic clays of medium to high plasticity	SAP	installation-wide sampling and analysis plan
max	maximum	ol	organic silts and organic silty clays of low plasticity	sc	clayey sands; sand-clay mixtures
MDL	method detection limit	OP	organophosphorus	Sch.	schedule
mg/kg	milligrams per kilogram	OSHA	Occupational Safety and Health Administration	SD	sediment
mg/L	milligrams per liter	OWS	oil/water separator	SDG	sample delivery group
mg/m <sup>3</sup>	milligrams per cubic meter	oz	ounce	SDZ	safe distance zone
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils	PAH	polynuclear aromatic hydrocarbon	SEMS	Southern Environmental Management & Specialties
MHz	megahertz	Pb	lead	SFSP	site-specific field sampling plan
µg/g	micrograms per gram	PCB	polychlorinated biphenyl	SGF	standard grade fuels
µg/kg	micrograms per kilogram	PCE	perchlorethene	SHP	installation-wide safety and health plan
µg/L	micrograms per liter	PDS	Personnel Decontamination Station	SI	site investigation
µmhos/cm	micromhos per centimer	PEL	permissible exposure limit	sm	silty sands; sand-silt mixtures
min	minimum	Pest.	pesticide	SOP	standard operating procedure
MINICAMS	miniature continuous air sampling system	PG	professional geologist	sp	poorly graded sands; gravelly sands
ml	inorganic silts and very fine sands	PID	photoionization detector	SP	sump pump
mL	milliliter	PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes	Ss	stony rough land, sandstone series
mm	millimeter	POL	petroleum, oils, and lubricants	SS	surface soil
MOGAS	motor vehicle gasoline	PP	peristaltic pump	SSC	site-specific chemical
MPA	methyl phosphonic acid	ppb	parts per billion	SSHO	site safety and health officer
MR	molasses residue	PPE	personal protective equipment	SSHP	site-specific safety and health plan
MS	matrix spike	ppm	parts per million	SSSL	site-specific screening level
mS/cm	milliSiemens per centimeter	PPMP	Print Plant Motor Pool	STB	supertropical bleach
MSD	matrix spike duplicate	ppt	parts per thousand	STEL	short-term exposure limit
msl	mean sea level	PSSC	potential site-specific chemical	STOLS	Surface Towed Ordnance Locator System <sup>®</sup>
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded	pt	peat or other highly organic silts	Std. units	standard units
mV	millivolts	PVC	polyvinyl chloride	SU	standard unit
MW	monitoring well	QA	quality assurance	SVOC	semivolatile organic compound
N/A	not applicable; not available	QA/QC	quality assurance/quality control	SW	surface water
NAD	North American Datum	QAP	installation-wide quality assurance plan	SW-846	U.S. EPA <i>Test Methods for Evaluating Solid Waste: Physical/Chemical Methods</i>
NAD83	North American Datum of 1983	QC	quality control	SZ	support zone
NAVD88	North American Vertical Datum of 1988	QST	QST Environmental Inc.	TAL	target analyte list

***List of Abbreviations and Acronyms (Continued)***

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TAT	turn around time
TB	trip blank
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compounds
TLV	threshold limit value
TN	Tennessee
TOC	top of casing, total organic carbon
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TWA	time weighted average
UCL	upper confidence limit
UCR	upper certified range
UJ	not detected above reporting limit; result should be estimated
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USAMCLS	U.S. Army Chemical School
USATEU	U.S. Army Technical Escort Unit
USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validated qualifier
VX	nerve agent (O-ethyl-S- [diisopropylaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd <sup>3</sup>	cubic yards

**APPENDIX A**

**SAMPLE COLLECTION LOGS AND  
ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**

## **APPENDIX B**

### **BORING LOGS AND WELL LOGS**

# **APPENDIX C**

## **WELL DEVELOPMENT LOGS**

## **APPENDIX D**

### **SURVEY DATA**

**APPENDIX E**

**SUMMARY OF VALIDATED ANALYTICAL DATA**

**APPENDIX F**

**DATA VALIDATION SUMMARY REPORT**

## **APPENDIX G**

### **VARIANCES**

**APPENDIX H**

**SUMMARY STATISTICS FOR BACKGROUND MEDIA, FORT  
MCCLELLAN, ALABAMA**